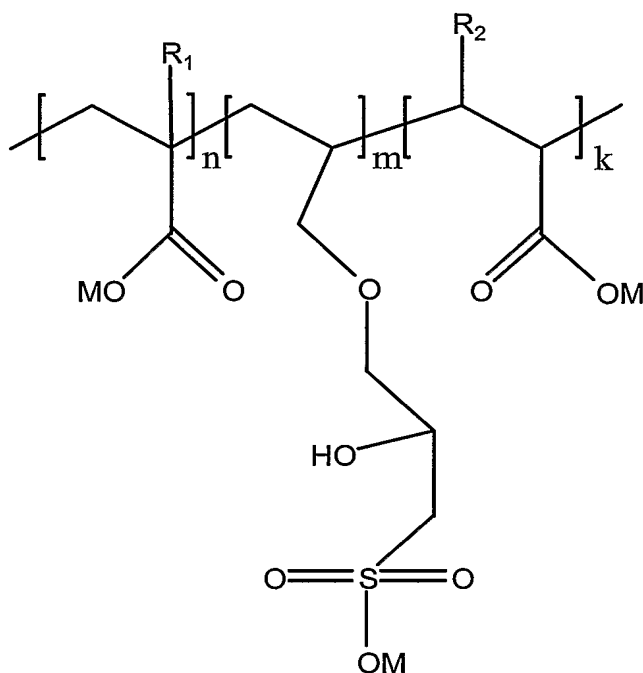


Claims

1. A process for the treatment of a fibre material comprising the step of contacting the fibre material in an aqueous medium with a chelating agent and a polymer having following general formula



5

I

wherein

R₁ is a hydrogen atom or an alkyl group containing 1 to 12 carbon atoms,

R₂ is -COOM or -CH₂COOM,

10 M is a hydrogen atom, an alkali metal ion, an alkaline earth metal ion, an ammonium ion or a mixture thereof,

n, m and k are molar ratios of corresponding monomers, wherein n is 0 to 0.95, m is 0.05 to 0.9, and k is 0 to 0.8, and (n+m+k) equals 1, and

the weight average molecular weight is between 500 and 20,000,000 g/mol.

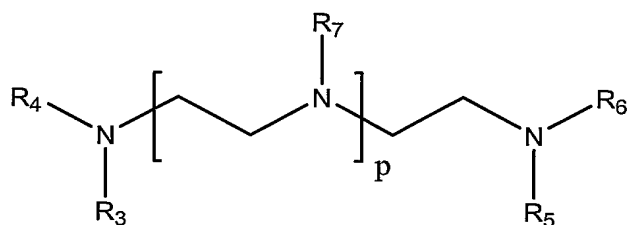
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2. The process according to claim 1 wherein the chelating agent and the polymer are introduced as a mixture or the chelating agent and the polymer are introduced separately.

20 3. The process according to claim 1 or 2 wherein the fibre material is a cellulosic fibre material comprising a chemical, mechanical or chemi-mechanical pulp or a recycled fibre material.

4. The process according to any of claims 1 to 3 wherein the treatment comprises bleaching the fibre material with an alkaline peroxide solution in the presence of the chelating agent and the polymer.
- 5 5. The process according to claim 4 wherein the bleaching is preceded by a treatment with a chelating agent.
6. The process according to any of claims 1 to 3 wherein the treatment comprises pretreating the fibre material in the aqueous medium comprising the chelating agent and the polymer.
- 10
7. The process according to claim 6 wherein the pH of the aqueous medium in the pretreatment is between 3 and 7, preferably between 4 and 6.5, and more preferably between 4.5 and 6.
- 15
8. The process according to claim 6 or 7 wherein the pretreatment is followed by a bleaching with a peroxygen compound optionally in the presence of the chelating agent and the polymer.
- 20
9. The process according to claim 8 wherein the peroxygen compound is hydrogen peroxide, peracetic acid or Caro's acid.
10. The process according to claim 1 or 2 wherein the fibre material comprises a recycled fibre material, and wherein the treatment comprises de-inking the recycled fiber material in the aqueous medium comprising the chelating agent and the polymer.
- 25
11. The process according to any of claims 1 to 10 wherein in formula I n is 0.4 to 0.9, m is 0.1 to 0.5, and k is 0 to 0.5.
- 30
12. The process according to any of claims 1 to 11 wherein the weight average molecular weight of the copolymer is between 1,000 and 1,000,000 g/mol and preferably between 2,000 g/mol and 500,000 g/mol.
- 35
13. The process according to any of claims 1 to 12 wherein the total amount of the chelating agent and the polymer in the treatment is 0.05 to 10 kg per ton of dry fibre material, preferably 0.1 to 5 kg per ton of dry fibre material, and more preferably 0.2 to 4 kg per ton of dry fibre material.

14. The process according to any of claims 1 to 13 wherein the weight ratio of the polymer to the chelating agent is from 1:4 to 4:1, preferably from 1:3 to 3:1.
- 5 15. The process according to any of claims 1 to 14 wherein the polymer is a copolymer of 3-allyloxy-2-hydroxypropanesulfonic acid and at least one of the monomers acrylic acid, methacrylic acid, maleic acid and itaconic acid or a salt thereof.
- 10 16. The process according to any of claims 1 to 15 wherein the chelating agent is a compound having following general formula

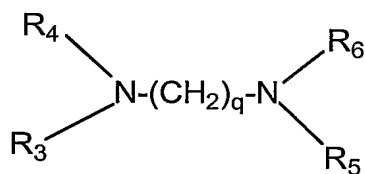


II

- 15 wherein
 p is 0 or an integer of 1 to 10,
 R₃, R₄, R₅, R₆ and R₇ are independently a hydrogen atom or an alkyl chain having 1 to 6 carbon atoms and containing an active chelating ligand, such as a carboxylic, phosphonic or hydroxyl group or a salt thereof.

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17. The process according to any of claims 1 to 15 wherein the chelating agent is a compound having following general formula



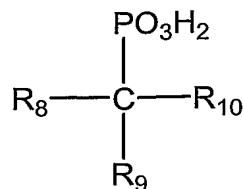
III

25

- wherein
 q is an integer of 3 to 10,
 R₃, R₄, R₅ and R₆ are independently a hydrogen atom or an alkyl chain having 1 to 6 carbon atoms and containing an active chelating ligand, such as a carboxylic, phosphonic or hydroxyl group or a salt thereof.

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18. The process according to any of claims 1 to 15 wherein the chelating agent is a compound having following general formula



IV

5 wherein

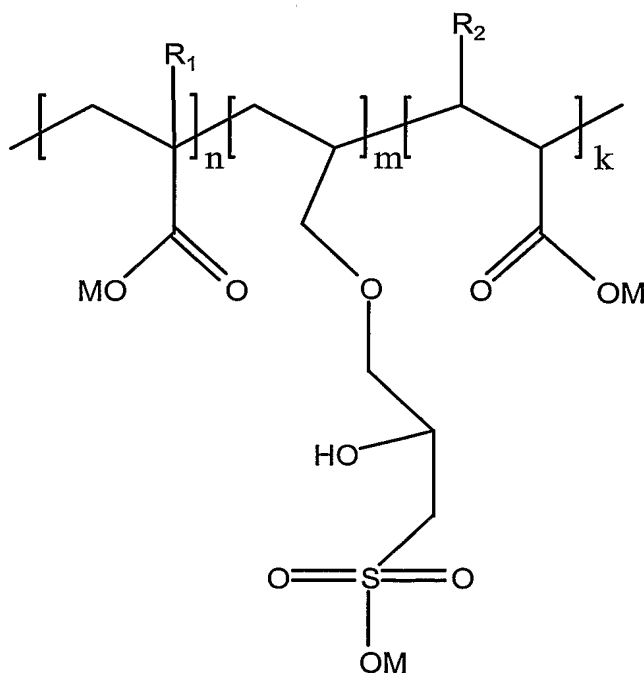
R_8 is a hydrogen atom, an alkyl group containing 1 to 6 carbon atoms or an alkyl chain having 1 to 6 carbon atoms and containing a carboxylic, phosphonic or hydroxyl group,

10 R_9 is a hydrogen atom, hydroxyl group, phosphonic group, carboxylic group or alkyl chain having 1 to 6 carbon atoms and containing one or two carboxylic groups, and

R_{10} is a hydrogen atom, hydroxyl group, carboxylic group, alkyl group containing 1 to 6 carbon atoms or alkyl chain having 1 to 6 carbon atoms and containing a carboxylic group, or a salt thereof.

15

19. A composition comprising a chelating agent and a polymer having following formula



I

wherein

R_1 is a hydrogen atom or an alkyl group containing 1 to 12 carbon atoms,

R_2 is $-\text{COOM}$ or $-\text{CH}_2\text{COOM}$,

5 M is a hydrogen atom, an alkali metal ion, an alkaline earth metal ion, an ammonium ion or a mixture thereof,

n, m and k are molar ratios of corresponding monomers, wherein n is 0 to 0.95, m is 0.05 to 0.9, and k is 0 to 0.8, and $(n+m+k)$ equals 1, and

the weight average molecular weight is between 500 and 20,000,000 g/mol.

10 20. The composition according to claim 19 wherein in formula I n is 0.4 to 0.9, m is 0.1 to 0.5, and k is 0 to 0.5.

15 21. The composition according to claim 19 or 20 wherein the weight average molecular weight of the copolymer is between 1,000 and 1,000,000 g/mol and preferably between 2,000 g/mol and 500,000 g/mol.

22. The composition according to any of claims 19 to 21 wherein the weight ratio of the polymer to the chelating agent is from 1:4 to 4:1, preferably from 1:3 to 3:1.

20 23. The composition according to any of claims 19 to 22 wherein the polymer is a copolymer of 3-allyloxy-2-hydroxypropanesulfonic acid and at least one of the monomers acrylic acid, methacrylic acid, maleic acid and itaconic acid or a salt thereof.

25 24. The composition according to any of claims 19 to 23 wherein the chelating agent is as defined in any of claims 16 to 18.

25. Use of a composition according to any of claims 19 to 24 as a stabilizer in bleaching of a fibre material in an aqueous medium.

30

26. Use of a composition according to claim 19 to 24 as a stabilizer in deinking of a recycled fibre material.